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S90 and the Modular Synthesis Plug-in System

PLG100-XG
Multi-timbral Synthesizer
Plug-in Board

A Getting Started Guide

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NOTE: The PLG100-XG is a *multi*-part board meaning it does not have a Voice mode, nor can the XG sounds be used in a S90 Performance but it is accessed via the MIX screen (multi-timbral). This is different from the PLG150 Series, *single* part boards that can be accessed via Voice and Performance modes in addition to being able to be used in a MIX. The S90 has a “pseudo” (many consider better than) General MIDI set of Voices, because of this you will need to determine if you need a PLG100-XG board. It can be used to inexpensively increase the multi-timbral capabilities of the S90 when you are going to be using an external sequencer (with more than 16 tracks) and the multi-port USB(MIDI) interface. This interface will allow you to address the S90 internal sounds on one port and the XG board on a separate MIDI port all inside the USB (universal serial bus) connector.

PLG100-XG: XG/GM Multi Board

The PLG100-XG is a 16-part multi-timbral synthesizer on a board. Sounds are accessed via MIX mode, as Parts 17-32 when used in the S90 synthesizers. Because it is multi-timbral the board must be installed in a specific expansion slot within the S90, slot #3 (all blue wires and one green). It can **only** be accessed via MIX mode (never Voice mode, never in a Performance). The PLG100-XG board is unique and behaves differently than the other PLG series boards that are available for use with the S90. Even if you are familiar with one or more of the PLG series you will want to pay close attention to how *this* board works within the S90.

You play the PLG100-XG sounds normally from MIX mode. The Voice mode [PLG3] button will **not** work to access the sounds on the XG board – because the board is multi-timbral. Think about it, you wouldn't want to push that button multiple times to select among 16 Parts, would you? It makes more sense to access a multi-timbral board from the multi-timbral mode. This is different from the normal internal S90 sounds that exist in Voice mode and are then assembled in a mix. The XG sounds are *only* accessible via this mix. This is in part due to the fact they are on the PLG board and you are addressing them using the S90 as a controller. They are a part of a separate synth engine. They even have their own System Effects. From the "MIXING" screen you can access the XG board sounds as PARTS 17-32 and you can use the sixteen Part/Track select buttons to access the sounds quickly. The S90's own internal AWM2 sounds occupy Parts 1-16. The PLG100-XG Voices occupy MIDI channels 1-16. But, hey, so do the Internal AWM2 S90 Parts. Isn't the sequencer of the S90 only 16 tracks? How do you **not** play both simultaneously? Shouldn't both internal and XG boards sounds react to data on a MIDI channel? Yes. That is the purpose of this document. First, let's see if you really need the PLG100-XG board for your S90. Here are the facts: although the S90 is **not** technically a GM/XG machine, it does have a built-in bank of 128 sounds in GM order and a GM drum kit mapped accordingly and will respond to GM files. Actually in some cases (most actually) the S90 sounds are bigger, fuller, more layers etc. That is not to say that automatically every GM file will sound better on the S90 than on the PLG100-XG board...it will depend on the programming. XG has specific protocol that allow the programmer great flexibility when it comes to customizing effects, EQ, envelopes, tuning, etc. A proficient programmer of XG can work absolute magic. In GM, and therefore also in XG, you do not store your 'multi' setups in the tone engine – the setup

data is stored in the sequencer as program change, control change and system exclusive messages. The S90 is not an XG device and will ignore some XG specific messages. The S90 'multi' setups, of course, can be saved in a MIX. The XG data must be stored in the sequencer. So do you need the XG board with a S90? You can already playback and re-voice GM files with relative ease with the sounds provided by the S90 GM bank.

The PLG100-XG board will be of use to S90 owners who:

- ...need strict XG compatibility to create and/or playback XG/GM format songs.
- *The most important thing this article can tell you follows: If you want the PLG100-XG for its GM/XG compatibility, its additional 32-note polyphony and its 16 additional Parts, then plan on using an external sequencer via the USB (MIDI) connection.*

This is the only way to take **full** advantage of the additional parts and polyphony. The XG board in the S90 will work to its full potential if you are using the USB-(MIDI) **multi-Port** connection from an external computer sequencer. In this scenario you can address the internal AWM2 sounds of the S90 on PORT 1 (MIDI ch. 1-16) and the PLG100-XG on PORT 2 (a separate set of MIDI ch. 1-16). Each PORT represents a complete set of 16 MIDI channels, completely independent of each other. This takes advantage of USB's ability to have multiple 16-channel MIDI connections simultaneously in the one connection cable. The S90 engine and the PLG100-XG engine can be addressed separately when an external sequencer is used. Typically a computer sequencer would have more than 16 tracks (the internal S90 sequencer is only 16 tracks and therefore can only address 16 parts simultaneously). With the USB multi-port interface you can take advantage of the full 32 parts. In other words, a SMF played from the S90's own Playback sequencer will be limited to a maximum of 16 tracks/16 MIDI channels.

Checking Installation

Check to make sure your board is properly installed. Here's how:

On the S90: Press [UTILITY]/ F6 PLG/ SF1 Status. The board should appear in slot 3 (ALL Blue wires, 1 Green wire) see Owner's Manual for installation info.

I just installed the board and I want to hear the sounds:

To audition the sounds on the board: (using just the S90...no external sequencer hooked up)

- Select any MIX
- Press [SeqPlay] it lights up RED
- Press F6 MIX
- If you are hearing two (or three) parts layered this is because both Part 1 and Part 17 (and PLG1) default to the same MIDI channel (1). If you wish to isolate just the XG sounds, you must MUTE PARTS 1-16 (and PLG1) in the MIX. Here's a quick way...
- Press [F3] Voice to view voice select mixer.
- Press [F6] repeatedly, as necessary, to select a view of PARTS 1-16. [F6] will toggle among your available Part views. The numbers [1-16] should read above the faders in the screen.
- Press the [MUTE] button (red) to view active tracks and turn OFF Parts 1-16 via the sixteen Track buttons. This will temporarily, mute all the internal AWM2 PARTS.¹
- Now press [F6] to view Parts 17-32 this selects the XG Board and reselects [TRACK SELECT]. 17-32 will show above the faders in the screen mixer.
- Highlight the Voice Number row and use [INC/YES] or Data Wheel to select XG sounds. The name will show in the upper right hand corner of the screen.

This may seem a rather clumsy and non-elegant way of selecting from among the 480 XG sounds. And you're right, it is. The way that XG was designed, the task of selecting Voices, editing sounds, tuning drums, creating a mix, etc., is all to be handled externally via a software front-end. XG and GM are best used with a sequencer utility that has all the editing functions built in.² Included with the PLG100-XG is Windows software called XGworks 3.0 Lite. This has a built in XG editor. If you all ready have a favorite MIDI sequencer you will need to download a shareware copy of XG Edit (available for Windows and Mac). It is an application that can run in the background of most MIDI sequencers and it acts like an instrument definition, mixer map or environment for you to address and edit, with elegance, the XG board. Why this external editor is so important is because, as with all the plug-in boards, when editing you need the computer screen to see the values you are

¹ If you do not hear the PLG100-XG at this point, press UTILITY/ F6 Plug/ SF2 MIDI and make sure that the PLG100-XG board is identified in SLOT 3 and that the PORT assignment is PORT 1. Setting the PORT to 2 will effectively turn OFF the PLG100-XG board to the internal keyboard (without the signal "echoing" from your external MIDI sequencer). More on this later. Press MIXING to return to our edit.

² One essential use of GM/XG is compatibility for use in computers where an XG sound set can be encoded in the sequencer application. Therefore you can count your mix sounding as you mixed on your system.

entering. The S90 screen will not reflect the changes, as you make them. The PLG100-XG will respond but it does not have a screen of its own. You will hear the results of your edit immediately but the screen you use will be the computer screen.

MULTI-TIMBRAL MIXES: S90 "PARTS" and MIDI channels explained

Now let's learn about how the Multi-timbral capability of the internal S90 works. There are **16 MIDI channels** in a basic MIDI 'system'. You have access to your S90 VOICES in a multi-timbral setup (MIX) via what are called PARTS. AWM2 sounds from [PRE1], [PRE2], [PRE3], [USER] and [GM] occupy **Part01 through Part16**.³ This system of assigning Voices to Parts may seem a bit mysterious, at first. But a quick look at the advantage that it gives will make this clear. An internal S90 Part has settings that can be stored locally, i.e., in the current Mix. This means that you can use an S90 Voice in MIX 1 and use the same Voice in MIX 24 completely differently. Each MIX can store a set of edits for your selected VOICE in what we are calling a PART. The PART parameters are applied whenever this MIX Template is recalled. You do not have to edit the Voice permanently back in Voice mode to adjust some basic mix functions. These "PART" parameters for S90 Voices include:

- Mono/Poly mode
- MIDI Channel receive
- Note Limit (key range)
- Velocity Limit
- Portamento (ON/OFF and time)
- Pitch Bend range
- Velocity Offset
- Volume
- Pan
- Element Pan* (where the voice recalls the Voice mode panning scheme or not. When OFF the sound can be placed in the mix manually)
- Effect Send
- Output Assignment
- Note Shift (transpose),
- Detune, Filter Cutoff,
- Filter Resonance,
- Filter Envelope Generator Depth,
- Filter Envelope Generator ADSR* (attack-decay-sustain-release),
- Amplitude Envelope Generator ADSR,
- Receive ON/OFF Switch for Controllers:
- Bank Select (cc0, cc32)
- Program Change
- Control Change (1-95)
- Pitch Bend Wheel
- Modulation Wheel (cc1)

³ If you add a PLG150 series board (AN, DR, DX, PC, PF or VL) they will occupy Parts P1-P3. And can *share* (split/layer) or *replace* an internal Part.

Channel Aftertouch
Breath Control
Assignable Controls 1 & 2
FC 1 & 2 (cc assignable)
Volume cc7
Pan cc10
Sustain cc64
FS (cc assignable)

An added advantage is that you can substitute a new Voice without disturbing the PART parameters. But the main advantage is that when you are tweaking a Voice to fit your music you can, to a great extent, do all the editing right within the MIX you are using. Part parameters are addressable via control messages you can place in your sequence. So you have dynamic control of many parameters. The significant thing is that all the internal S90 Voice Part setup parameters will be memorized when you [PUT] the MIX to a TEMPLATE so you do not have to place information about the S90 Parts (01-16 and P1-P3 if they contain a PLG150 board) in your sequence data...

What about the Multi-timbral PLG100-XG Parts...how are the setups remembered?

When a PLG100-XG board is installed in slot 3, it behaves entirely differently than the PLG150 series (single part) board. The PLG100-XG is a multi-timbral synth all by itself. The setup data for the XG Parts (17-32) is not memorized in a Mix. By design every parameter used to setup an XG/GM mix must be placed as system exclusive and/or control change messages within the sequence data. When you look through the EDIT parameters for Parts 17-32, you will see a similar selection of parameters as those for the internal S90 sounds. However, these parameters are not memorized in the S90 mix. By design, when a XG and/or GM Reset command is received by the PLG100-XG all parameters will be reset to a default condition.

- UTILITY/ F6 PLUG/ SF2 MIDI. The GM/XG parameter here sets the ability of the PLG100-XG to receive or ignore an incoming Reset command.

The language of MIDI includes different types of messages. There are System Exclusive⁴ messages and Control Change⁵ messages among others. In general, control change message can be sent during the playback of music data. They

⁴ Each manufacturer can address their own products via this coded message (that's the exclusive a Yamaha can read this message but other cannot). They are divided into bulk and parameter types.

⁵ Control Change messages are designed for use during playback.

can be manipulated without disturbing the timing of playback. On the other hand, System Exclusive messages (depending on the type) can disturb the groove because some of them require the receiving module to "stop, what it is doing" and pay attention to a very important reconfiguring message. True, you can send a short parameter change string here and there, if you are extremely careful about where the message is placed. It is this language that is used to configure and change the XG parameters. It is designed to use the sequencer to send these important setup messages. Later in this article we will talk about the elegant method to control the XG board.

The purpose of the XG/GM board is principally to playback MIDI song files that have been *specifically* prepared to take advantage of the XG/GM sound set and language protocol. These prepared XG/GM files will automatically setup and recall the proper Voices and effects. It is important to understand that although there are now **32 Parts**, there are only **16 MIDI channels** in the basic S90 system, and only 16 tracks in the S90's playback sequencer. This means that sounds will have to *share* MIDI channels if you are using the internal sequencer. You can **layer** PLG sounds with internal AWM2 sounds, or you can **split** the sounds by using the Note Limit parameter to create a zone. Or you can use the XG sounds exclusively or not at all. Of course, you can change the MIDI channel of any Part, as required. The proper way to use the PLG100-XG requires you take advantage of the USB connections ability to address the S90 on up to 3 separate MIDI PORTS, simultaneously. Next we will take a look at the Multi-Port option of addressing the PLG100-XG board.

Summary: As you add Plug in boards each will have its own Part but *share* a MIDI channel with one of the other sounds. You can then choose to layer (play together) or split (limit the key range) the Parts on a single MIDI channel for live play. You also can turn each one ON or OFF as suits your needs. [Although the board goes into slot 3 the [PLG3] bank button cannot be used to access the XG Voices. Because the PLG100-XG is multi-part the sounds are only accessible via a MIX – a Mix has 16 slots making it convenient to access the multi-parts.

PORTS and PARTS: Each Port has 16 Parts. when you use an external sequencer to control the S90/PLG100-XG, then you can take advantage of the multi-PORT system to address 32 PARTS. You can address the internal S90 Parts 1-16 from your software via PORT 1 and

address the PLG100-XG board Parts 17-32 on PORT 2. If you then add one or two PLG150 series synth boards they can be addressed via separate MIDI channels on PORT 3. Most commercially available pro sequencers let you address multiple MIDI systems (each 'system' 16 parts) via assignable MIDI PORTS. You can usually assign each individual track to a Port, as necessary. This scenario is the one that makes the most sense. It is highly recommended that you use the multi-port capability to get the most out of the PLG100-XG/S90 connection. One a track-by-track basis you can assign a track to any of the PARTS available.

Setting up your EXTERNAL SEQUENCER for use with the PLG100-XG

The ultimate goal here is to setup your S90 so that it can be addressed via your MIDI software. Each software sequencer will be slightly different in terms of how it is configured so we can only give you general instruction (for specifics please refer to your software's instructions). We will use XGworks as an example because it is provided with every PLG100-XG board. So your mileage may differ when you setup your favorite software but the theory of operation will be the same.

Preparing the S90:

Set the unit to send and receive MIDI via the USB connection:

- UTILITY/ F5 MIDI/ SF4 Other: Set MIDI IN/OUT to USB
- UTILITY/ F5 MIDI/ SF2 Switch: Set LOCAL CONTROL to OFF. LOCAL CONTROL off turns the connection between the keyboard and the tone engine. Setting this to "off" will mean that the S90 keybed is now routed out via MIDI first, and is returned to the S90 Tone Generator only after it has been sent to the Sequencer. You will have to route the signal ("channelize") via the software using what is called either ECHO, ECHO BACK, THRU or sometimes SOFT THRU. In the SETUP pulldown you can select THRU to send signal from the selected track in the software to the S90 Part according to the Track's PORT assignment. With the XGworks software you "arm" a track by clicking on the RECORD box for the channel you which to communicate with. In a column labeled "R" you can select a track by simply placing a red R in the box. Each track of your sequencer can be routed, individually to either PORT 1 - which will communicate with an internal S90 PART 1-16 or to PORT 2 - which will communicate with a part on the PLG100-XG 17-32. When you break this LOCAL connection you will get no sound until you

complete the circuit by routing the signal back from the sequencer software in your computer. Do not worry now, let's complete the S90 setup with the following PLUG IN setup.

The PLG100-XG Plug-in parameters can be found by pressing UTILITY/ F6 PLUG.

- **SF1 Status** – this will show you what boards are installed in which slot. The PLG100-XG must be in slot 3 in order to work. Poly Expand refers to single part boards like the PLG150-AN, DR, DX, PC, PF and VL.
- **SF2 MIDI** – this will show you a Device number (ALL) or communication bus used when multiple boards of the same type are used. We can leave this set to ALL. PORT NO. (Port Number) Set this to PORT 2. This will allow us to address the Internal S90 sounds in a MIX on PORT 1 and the XG board separately on PORT 2.⁶ The internal S90 sounds are fixed to PORT 1.
- **SF3, 4, and 5 Native** – the so called "Native3" parameters would be the PLG100-XG – since it is in slot 3, however, there are **no additional parameters found here**. Only certain PLG150 series (single part) boards will have parameters here AN, DX, PF and VL.

Installing XGworks to your Computer

Please refer to the instruction for installation. This guide will assume you have both the software installed and have found the proper USB driver. If you are having trouble with the installation please consult www.yamahasynt.com for the latest official news on drivers and installation issues.

Once installed and launched, you will find SETUP on the XGworks task bar. Select the pulldown menu item called "SYSTEM SETUP..." First let's understand what is being assigned here:

MIDI IN "Yamaha USB MIDI 0-1". This is the S90 Keyboard sending IN to the software. You want to send on USB Port 1. Anytime you complete a Port 1 connection you will be communicating with the Internal S90 Voices.

MIDI OUT You will see that there are a possible six Ports with this software. Ignore all but the first two, for now. Set PORTS 3, 4, 5, and 6 to

⁶ If ever you are using the S90 alone (no seq) and you want to effectively turn OFF the PLG100-XG, remember that this parameter, PORT NUMBER, will silence it to your S90 keys. Sound can only reach the PLG100-XG now if they are echoed back from software on a track assigned to Port 2.

the “off” position. You will see a double dash at the bottom of each list of destinations that signifies OFF.

If you place “Yamaha USB MIDI 0-1” in the first PORT assign **and** “Yamaha USB MIDI 0-2” in the second PORT, the current XGworks song will be ready to record initially to the S90 **internal** parts. Each track will be set to USB MIDI 0-1. You can freely change these per track. But if you know you are going to be working mostly in the S90 first, you will want to set up with 0-1 in Port 1 and 0-2 in Port 2.

If you reverse the order, place “Yamaha USB MIDI 0-2” in the first PORT device assignment and “Yamaha USB MIDI 0-1 in the second PORT device, you will be setup to address the PLG100-XG on all tracks initially. Again, you can change any tracks port assignment by selecting the PORT heading on the main TRACK VIEW. The thing to remember is that INTERNAL S90 is PORT 1 and the PLG100-XG is PORT 2.

Select an initial OUTPUT PORT setup from the two options mentioned above. For our purposes, lets address just the XG board. This would be option 2. PORT 1 = USB 0-2; and PORT 2 = USB 0-1.

On the main Track View toolbar “click” on the XG icon. This will open XG Edit. (If you are using a standalone version it will look exactly the same). On the toolbar of the XG editor “click” on the icon that looks like a little tone module. This will allow you to select the voice listing for this particular XG product. Find on the list of product categories the “OTHER” category. “Click” on the “+” sign and find the **PLG100-XG** Tone Generator listed. Select it. The software now has loaded the names of all 480 sounds on the PLG board so that you can use the Voice name slots of the XG Editor to select your sounds easily and elegantly. It also knows what effect processors are available to address. This software is speaking directly to the PLG100-XG itself. You can drag and drop effects to tracks...its pretty cool.

Double “click” on the first name slot that reads Grand Piano. You can now view the 16 categories of Voices and just like navigating a “tree” you can select sounds. As you begin to explore this software you will find that you have assignable sliders and various views to your data. You can go to the WINDOW pulldown and select to view both screens together by selecting TILE VERTICALLY or HORIZONTALLY.

Specification and Operation

The **PLG100-XG** board has 480 normal preset voices and 12 Drum kits. The technology behind the XG board is AWM2 sample playback. The board has its own fully editable Reverb, Chorus and Variation processors. Variation is so called because it is switchable between being a system-wide effect (where all parts have a send to it) and an Insertion Effect (where it is isolated on a single part but can be manipulated via MIDI controllers in real time). You can control all of XG’s parameters via system exclusive and channel control change messages.

XG is a special protocol that features more than 32 real-time control messages that can be used to do everything from tuning individual drums in real time to setting up effect processors from the sequencer. XG is an extended set of General MIDI that not only gives you more sound selections when it comes to a Voice category, it lets you control the performance of sounds remotely via MIDI commands. Think of the set of 128 sounds as the *principal* bank. Like GM, the 128 XG sounds in the principal bank (00/00) are categorized into 16 categories, 8 sounds per category. The categories are: 1-Pianos, 2-Organs, 3-Chromatic Percussion, 4-Guitars, 5-Basses, 6-Strings, 7-Ensemble, 8-Brass, 9-Reeds, 10-Pipes, 11-Synth Leads, 12-Synth Pad, 13-Synth Effects, 14-Ethnic, 15-Percussive, and 16-Sound Effects. But the XG set is more than just 128 sounds. In parallel banks (of 128 or less) you can select alternate sounds for the 128 principal sounds. XG gives you access to more sounds by listing the sounds in parallel banks. You just need to use the correct bank select code to access them. Instead of just a single Fingered bass sound (GM Program Change #34), XG gives you several alternate Fingered bass Voices to select from – they are all program change #34 but in a parallel bank. Instead of just a Fender Precision fingered bass, you can select an Alembic fingered bass with Flange or perhaps a Music Man fingered bass.

When you install the PLG100-XG board in the host product you have the option of turning GM/XG Receive Switch ON for the board. This is set under [UTILITY]/ F6 Plug/ SF1 Status – this screen will only appear when a PLG100-XG board is installed. This will reset the PLG100-XG board anytime a GM/XG reset messages is received.

How does this GM/XG thing work?

Typically, the first command sent from a properly prepared GM or XG file will be the GM reset and /or XG ON command. A bit of explanation is due here. In GM and XG modules the parameters that edit Voices and effects are **not** stored in RAM, as

with a typical synthesizer or module – they are stored within the sequence data (as control data and system exclusive messages). Typical GM modules do not have an internal RAM bank that memorizes your multi – the multi is stored in the so called “Setup Bar” in the song data. (This is the reason that GM modules can be less expensive...no SRAM). Each new song has its own setup, therefore the first event of a properly prepared GM/XG file will return all parameters to a neutral or *default* condition via a RESET command. RESET condition places a grand piano in each channel except MIDI channel 10, which is reserved for drum kits. It will return all pan positions to center, all volumes to 100, all reverbs to 40, all chorus sends to 0, and it will neutralize all control parameters. Following the reset command comes all the information to reconfigure the mix for your song. The SETUP BAR is a very important concept within XG and GM. When you work with a computer front-end like the aforementioned XGworks, it will allow you to setup all the parameters with a graphic interface and it can automatically create your setup bar for you. You can then cut and paste it into your main sequence or you can store it as a bulk setup file. How does this information impact you with a S90? Doesn't the S90 already have an GM sound bank?

Yes, the S90 has a pseudo-GM sound bank and this needs to be dealt with. The S90 can memorize its own internal multi setups in a TEMPLATE – this is for internal PARTS 01-16 and for PLG150 Board PARTS if installed. The PLG100-XG sounds, Part 17-32, however, will need to be reset with **each** song. XG multi setups are **not memorized** in the host. You will need to organize the setup data in your sequence data. If you are setting up to create GM or XG format songs, you will want to use a computer utility called, “XG Edit”. It is available as part of XGworks software (included with the PLG100-XG) and as a shareware standalone editor downloadable from the Internet at www.yamaha.co.uk/xg/html/software/s_xgedit.htm for both Windows and Mac. This makes selection of Voices and manipulation of XG banks easy as pie. It also lets you make setting via an intuitive interface and will create the control data/system exclusive messages for your setup bar for you – inserting the data in a nice neat package. Most commercially available sequencers will have a profile, instrument definition or mixer map for the XG Voices/parameters which will allow you to work easily and elegantly with the PLG100-XG sounds and its effects processors.

What is an RESET command and what does it look like?

You can experiment with how this all works by sending an XG reset command to the S90 from the XGworks 3.0 Lite software or XG Editor software. Here's how: From the main track screen you will see an XG icon on the toolbar, **X** . Clicking this will launch the XG Editor (Mac users - XG Editor is a stand-alone program). Once the XG Editor screen is open you will see another small XG icon on the toolbar of the editor **x** – this one will automatically send the XG Reset message:

FO 43 10 4C 00 00 7E 00 F7

GM Reset message:

FO 7E 7F 09 01 F7

The RULES:

Things you must know about using the PLG100-XG board in the S90

- The PLG100-XG sounds are accessed from MIX mode **only** (the board is 16-part multi-timbral). You will see it as PARTS 17-32, while internal AWM2 sounds occupy Parts 1-16. You must access the board from MIXING or MIXING EDIT. The [PLG3] button is **not** active with a PLG100-XG board installed. The XG board cannot be accessed in VOICE mode.
- The PLG100-XG can **only** occupy slot 3 in the S90 (the multi-timbral slot).
- External Sequencer: Via the USB-(MIDI) connection you can address the XG Board independent of the S90 internal Parts. This is the ideal basic connection.
- The best way to access the XG multi-part system, when sequencing, is via the provided XG Editor. For Windows PCs the XG Editor is part of the XGworks Lite v3.0 software. For the Macintosh, XG Editor is a stand-alone program. The software allows you to easily navigate through the 480 XG Board Voices and 12 drum kits via an organized category listing.
- The way that GM/XG systems work is that program setups (MIX) are stored as part of the sequence data, not as part of the S90 MIX. Usually found at the very beginning of all *properly* prepared GM/XG files are the reset commands. A GM RESET/XG ON command returns all settings to default values: Grand Piano on MIDI channels 1-9, 11-16, standard drum kit on channel 10; volumes set to 100; pan to center; Reverb to 40; chorus send to 0; etc. In the very first bar you would put all your setup data, i.e., bank select/program change, volume, setting for the effects, pan and so on. The XG Editor

lets you set everything using a graphic interface map and when you have it sounding just as you like, you can have the software create (and insert) the entire XG parameter setup into the sequence for you. The setup data includes all effect routing, voice selections and the GM/XG reset commands – *it is all done for you* (icon on the toolbar for Insert XG Parameter). Or you can store this setup data separately and send it prior to playing back the file. If you are **not** using XGworks as your principal sequencer you will want to download an instrument definition/mixer map for the PLG100-XG for the software you are using. You should be able to find XG maps for most of the popular sequencing programs. You can find these at the Yamaha site: www.yamaha-xg.com Look for **Drivers, Tools and Software** section. Here you will find Cakewalk Instrument Definitions, Cubase Mixer Maps, utilities for both Windows and Mac.

- If you do not have a 'mixer map' or 'definition' and are not using XGworks, good-luck selecting sounds. No, just kidding. It can be done it is just that there are a lot of sounds. Recognize that the Program Changes in the XG protocol 1-128 call up the basic GM sound and in parallel banks XG offers substitutes. For example, sound #82 is Saw Ld (sawtooth lead) but in parallel banks you will find 11 substitutes for the sawtooth lead. Go to [MIXING]/ [EDIT]/ and use [F6] to select Part 17-32/[F1] Voice to select individual program changes and banks. Sound #34 is Fingered Bass (Electric Bass w/Finger) but in an alternate bank you will find a fingered bass with a modulation effect, "Mod Bass". In other XG products you may find additional substitutes in the slots. The MU128 and MU2000 will offer more selections as substitutes for that program change number. But if someone prepared an XG file using a 'fingered bass' substitute sound that you did not have, well you would still get the basic fingered bass sound – you just wouldn't know you were missing it! (This illustrates some of the important features of XG: compatibility, scalability and expandability).
- It is **normal** for the screen of the host product (the S90) **not** to reflect the settings and program names as you change data in external software. You will hear the results, however, but the screen will not update. This may seem a bit strange at first but is due in part to the fact that the screen is part of the host not the PLG board, after all. It will not visually update as you change items in the

software. The S90 screen will only reflect selections you make via the S90's front panel. The Board does not have a screen but uses the computer to help you select sounds. Don't panic if you hear a flute and the S90 screen reads Grand Piano. This is normal when you are using the computer or external sequencer to control the PLG100-XG board. Okay all that said, then why is the screen and parameters there if the S90 will not store them either? One reason is you could be temporarily trying out something and you just want to quickly make an adjustment.

- In order to view the names of the selected instruments in a commercially prepared XG song file, open the XG Editor prior to beginning playback. When you start playback from XGworks the setup bar will cause the software to show you the names and the mixer setup for the file.
- XG Parts 17-32 are **not** stored in the S90. All GM/XG parameters must be stored in the sequence data (setup bar) or as a sysex dump. The data can be saved in the following ways: XGworks actually lets you insert the data into the sequence...on the toolbar you will find an INSERT XG PARAMETERS icon. You can save this small packet of information as a system exclusive bulk...under the FILE pulldown you will find a SAVE XG PARAMETER FILE option (.syx). All data concerning the Internal S90, PLG1 and PLG2 banks will be stored in the S90 MIX Template.
- UTILITY/ F5 MIDI/ SF4 Other: The THRU PORT setting (1-8). This setting will allow you to send an additional PORT through the S90 and OUT the MIDI OUT jack. If you have another Multi-timbral module connect it to the MIDI OUT of the S90. You can go to your software (XGworks or other) and activate an additional MIDI OUT PORT in the setup. For example, if you go to the XGworks SETUP pulldown and place "Yamaha USB MIDI 0-3 in PORT OUT 3 and you set the THRU PORT parameter in S90 to 3 – those tracks will go on through to your additional module.

Tips: Troubleshooting

- A GM ON/XG Reset message will, under certain conditions, effect Internal parts of a MIX (Part01-Part16, PartP1 and PartP2, to OFF). You should always address the S90 via USB (MIDI) multi-port setup to avoid duplication of internal and PLG sounds.
- Go to www.yamaha-xg.com for more details on the expert use of XG – it is much deeper than most people think). There are excellent tutorials on XG and XGworks, online.

- If you are getting no sound from any Parts, Performances or Voices in your S90, try the Master Volume in [UTILITY]/ [F1] TG. Some song files have a fade out and leave the Master Volume set to 0. If you stop a song during a fade out you may inadvertently lower the volume of the entire machine. Many people own the machine for years and never touch this parameter and are surprised that a sequence they played changed this parameter. (Master Volume is a System Exclusive message that is universal to all MIDI devices).
- If you are using the XG board and S90 sounds together, you may find the cc121 = 0 message useful. This will reset all controllers, that is, both non-XG and XG Parts, to zero. This is a great tool for resetting controllers like BC, expression and others that may not be immediately obvious. It is a per channel message.

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