



**THE F2 SYSTEM**

**THE REVOLUTIONARY  
MARTIN F2  
THE WORLD'S FIRST  
RECONFIGUREABLE TWO-BOX  
SYSTEM.**

The F2 owes its origins to our horn loaded modular (or component) systems. These systems perform best when deployed in homogeneous close coupled vertical columns of bass, mid and high modules. Columns used for medium and long throw are supplemented by full range "stacks" for closer coverage.

No two venues are ever the same. Every artist has different requirements. Audience size can vary between 200 and 100,000. Every situation requires a loudspeaker system tailored to suit it. The full range "one box" systems, popular until recently, are being replaced with "two box" designs offering more flexibility. However, with conventional two box systems it is not possible to close couple all elements, and there is no way to accommodate the conflicting requirements of short, medium and long throw.

The F2 solves these problems by using a "rack mount" cabinet for the top box. This rack accepts horn/driver modules either in combinations, or in multiples of the same type. Close coupled column racks for each frequency band above 220 Hz can rapidly be assembled. An innovative three point cabinet coupling system allows extended close coupled column arrays to be constructed with controlled vertical and horizontal coverage. This technique, which we call "column" array technology" provides impressive system headroom with consequent low distortion at the desired operating levels.

Proprietary horn loading techniques endow the F2 with unparalleled efficiency, superb transient performance and very low distortion. We feel that the F2 system has the industry's best power output to size, and weight, ratio. With fewer cabinets required for a desired SPL, user cost benefits can be substantial. A logical upgrade path is provided for within the rack mount concept, allowing the user to take advantage of future technological advances.

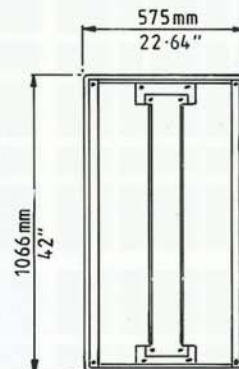
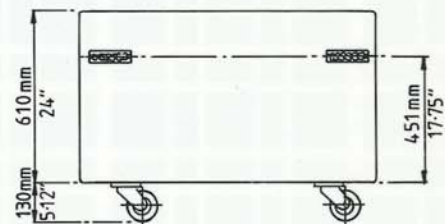


**F2R RACK**

This is the heart of the F2 concept. It derives from the amp/effects rack, wherein a given number of "units" or "blanks" are fitted. Just as in a conventional rack, the F2R is user configurable for any application or user preference.

Each horn module is retained by two clamping bars, to which it is pressed by rear mounted compression springs. These springs locate in a steel channel which reinforces the upper and lower rear hinge attachment points. Machined steel hinges serve to link cabinets, and maintain the accurate front-to-back alignment between cabinets essential to coherent column performance.

Long, medium and short throw racks can be rapidly configured by the system operator to match the coverage and throw requirements of any venue. The F2R is configured with four independent circuits accessed internally and externally via Cannon XLR3 compatible connectors, linked to an external EP8 multipin connector. Aeroquip T32102 compatible side mounted tracks are installed at both ends, allowing azimuth adjustment between adjacent racks or bass horns. A quick release acoustically transparent perforated steel grille locates via spring tension to grooves in the rack sidewalls.



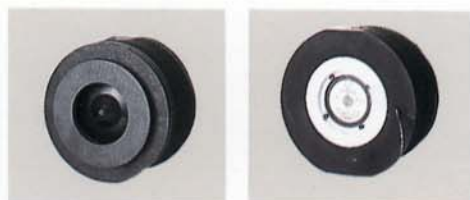


## HORN MODULES

Each horn module ( as well as the supertweeter array) is sized to occupy a vertical number of units, such that a full load of identical units fills the entire rack. Racks can be formatted using module combinations, and complete F2 arrays assembled using these combinations for optimised coverage. Unused spaces within racks are filled with lightweight "blank" modules.

Horns are moulded using a polyurethane based formula possessing good internal damping properties. Precision tolerances, with parallel faces top and bottom ensure stable location within the rack. Drivers are press fitted in their horns, and are retained in position by rear mounted rack springs. Strip and reassembly is rapid.

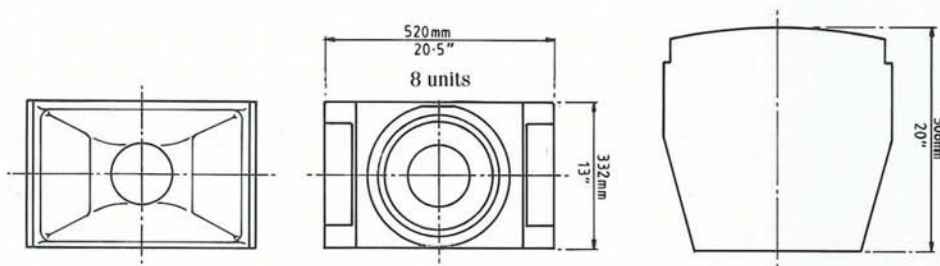
All horns are designed with a nominal 65° horizontal constant coverage pattern, with the integrated system having a centre weighted coverage profile between 500 Hz and 3.5 KHz. This custom pattern map provides excellent arraying properties, with substantially reduced comb filtering when arrayed side-by-side.



Proprietary 5.5" exit compression driver.

## F2M MID HORN

The F2M uses the world's largest dedicated mid compression driver. This proprietary 5.5" (140mm) exit driver uses a carbon fibre reinforced diaphragm driven by a 3" (75mm) edgewound coil operating in an unusually powerful magnet structure: gap flux is 16.5 Tesla, total flux 400,000 Maxwells. Special diaphragm edge termination eliminates diaphragm breakup, while a centre phase plug and sealed acoustically damped rear chamber provide a linear passband response. A low compression ratio of 3.3, in conjunction with the large exit area gives very low throat distortion.



	F2M	F2H	F2V	F2T
Horn Type	Horizontal Constant Directivity	Horizontal Constant Directivity	Horizontal Constant Directivity	Horizontal Phased Array
Compression Drivers	Martin M55 Mid Compression Driver 5.5" Exit	JBL 2445 2" Exit Titanium Diaphragm	JBL 2425 1" Exit Titanium Diaphragm	3×JBL 2402 Ring Radiators
Bandwidth	180Hz-1.6KHz	1KHz-15KHz	4KHz-16KHz	6KHz-18KHz
Rated Dispersion	65°H×40°V	65°H×40°V	65°H×30°V	65°H×40°V
System crossover points	220Hz	1.5KHz	6.5KHz	7.5KHz
Input Impedance	10Ω (Min 8.2)	12Ω (Min 11.7)	15Ω (Min 13.5)	20Ω (Min 16.2)
Sensitivity (1)*	108dB	112dB	103dB	110dB
Rated Power (2)*	150W	75W	50W	60W
Programme Power (3)*	330W	150W	100W	120W
Recommended Amp Power	470W-550W Into 4Ω	470W-550W Into 4Ω	470W-550W Into 4Ω	470W-550W Into 4Ω
Rack Space (4)*	8 Units	6 Units	4 Units	3 Units
Weight	19.3Kg (42.5LBS)	18Kg (40LBS)	8.5Kg (19LBS)	9.7Kg (21.5LBS)

### \*NOTES:

(1) Measured at 1 Metre over stated bandwidth with 1W input into driver. All horns except F2M use power match networks, enabling identical amps to be used throughout. 1W into network input will therefore not produce 1W at driver.

(2) Continuous average Sinewave.

(3) Stated programme power is manufacturers rated specification and is close to typical max drive power in the system with specified amp power.

(4) Each rack has 24 internal units.

Blanking Modules are supplied in 4 or 3 unit size.

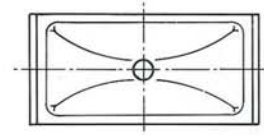
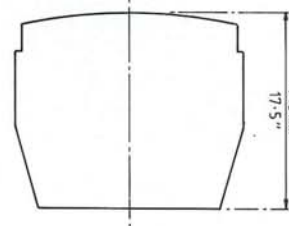
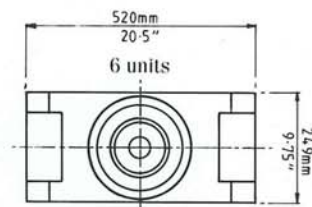
E & O E.

Due to a policy of continual improvement, specifications may change from time to time.

## F2H HIGH HORN.

The F2H, in common with all other F2 system horns, is designed to enable its installed compression driver to perform in an optimised environment.

Our research into contemporary 2" (5cm) entry horns has shown that the popular diffraction slot throat, used in many designs for pattern control above 10 KHz, results in up to 3 dB increase in distortion. Further listening tests proved that horns with no expansion discontinuities sounded best. The F2H employs a conical expansion law, with exponential termination for ripple free response. High "forward gain" further ensures that the F2H is clean and accurate at high acoustic output levels.

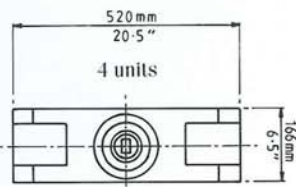
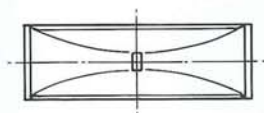
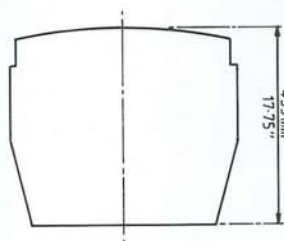


A combined high pass filter and impedance compensation/power matching network provides reliable operation under all user conditions.

## F2V VHF HORN

In typical arenas, air transmission loss prevents effective coverage above 10 KHz to all areas. The 1" (2.5cm) exit compression driver has found favour with many system operators. Its lower efficiency is offset by increased power handling, and unlike the ring radiator it is time-compensated by virtue of the driver alignment being in the same plane as that of the mid and high horns. Substantial, coherent SPL may be generated in the 7-10 KHz band, whilst at closer distances accurate response to 16 KHz is attained.

The F2V horn matches the horizontal dispersion of the F2H, while the narrow vertical coverage increases axial SPL, and optimises its use in column arrays. Rack space is four units, enabling a coupled column of six to be used for ultimate long throw. An amplifier power matching and protective high pass filter is fitted.



## F2T SUPERTWEETER ARRAY.

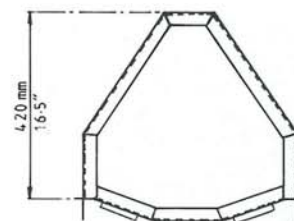
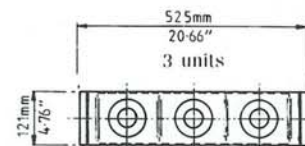
Examination of the upper high frequency performance of contemporary 2" (5cm) exit compression drivers proves that few have sufficient clean output above 8 KHz. (The one exception does not sound musical in its mid band at high power levels.) "Ring radiator" supertweeters are the most efficient devices above 8 KHz, and are unequalled for short/medium throw use.

Reliable performance is assured by correct power matching, whilst for long term stability each radiator is fitted with a fine pitch stainless steel grille.



This avoids diaphragm contamination due to dirt and magnetic particles.

The F2T employs three ring radiators, carefully arrayed to provide flat response in the 8-16 KHz octave.





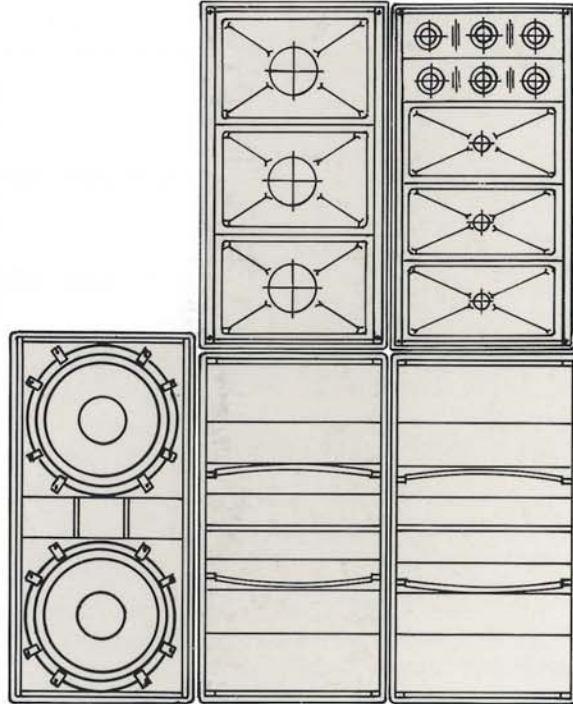
## TYPICAL CONFIGURATIONS

The smallest complete, "Long throw stack" consists of

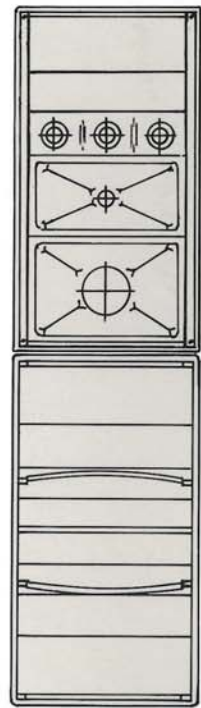
2×F2B bass

1 F2 rack fitted with:  
3 F2M

1 F2 rack fitted with  
3 F2H  
2 F2T



BSX Sub bass optional



"Short/medium throw stack"

The minimum complete stack comprises two cabinets as follows

1×F2B bass

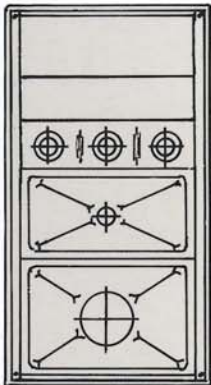
1×F2 rack, fitted with:

1×F2M

1×F2H

1×F2T

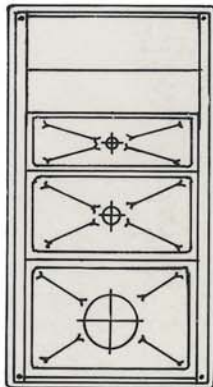
## RACK ARRAY EXAMPLES



Combination array  
(Combi)

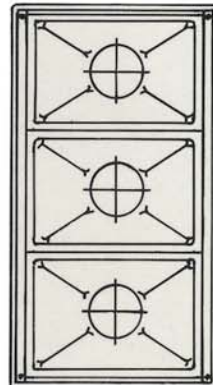
1×F2M, 1×F2H,  
1×F2T.

Short and medium  
throw. Forward gain  
reference = 0 dB\*.



Combination array  
using F2V.

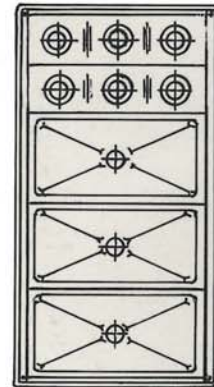
Used in systems with  
other F2V arrays for  
full compatibility.



Mid array.

3×F2M.

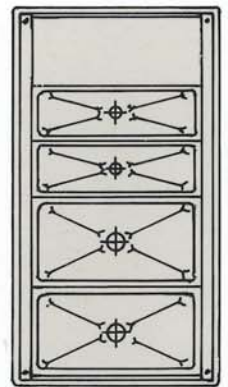
Medium and long  
throw applications.  
Forward gain = 9 dB.



Medium/long throw  
extended range array.

3×F2H, 2×F2T.

Mid band forward gain  
=9 dB.



Medium throw  
extended range array.

2×F2H, 2×F2V.

Forward gain = 6 dB  
for both bands.

\*The concept of forward gain is useful for establishing a clear picture of system coverage and throw. Forward gain is calculated assuming all drivers are fed the same reference voltage. For two vertically arrayed horns, power gain is 3 dB. On axis array gain is 3 dB. Adding the two gives 6 dB of forward gain.



## FLYING SYSTEM.

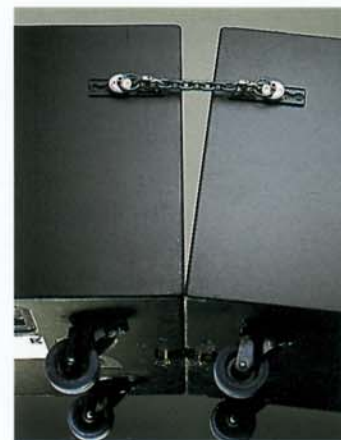
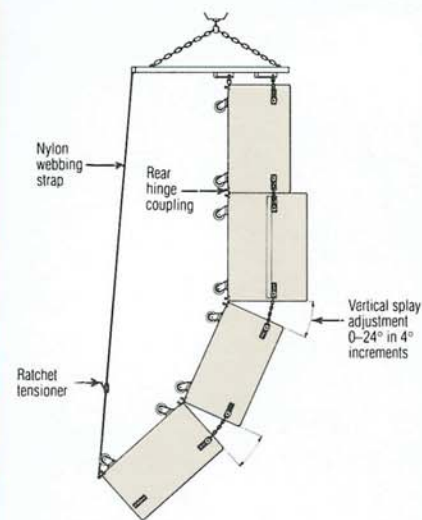
A unique three point cabinet coupling system enables the vertical splay angle between cabinets to be altered in 4° increments to 24° maximum. Cabinets are rear linked by a hinge coupling, and at the side using chain coupled Aeroquip connectors which mate to compatible alloy track. Both the F2B and F2R have identical fly point locations and are thus able to fly at any position within a column. Columns are stabilised using a pull-up strap attached from the base of the bottom cabinet to the frame.

The system has been stress tested by an independent engineering laboratory, and is presently load rated to fly five deep.

Several rental companies using the F2 have developed their own flying frame systems. We collaborate with F2 users in the development of column array technology, and will assist in the sourcing of flying hardware.



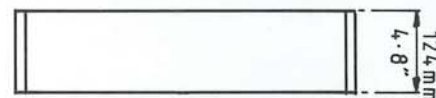
*Flying cluster for Sade. Bercy. Paris.*



*Intercabinet connecting kit*



4 Rack units (as F2V)



3 Rack units (as F2T)

## BLANKING MODULES.

Unused spaces in a rack must be filled with blanking modules. These are moulded in the same material as horn modules and are visually compatible. Two sizes are available, and various combinations of these will permit any space in a rack to be filled.

## MX4 SYSTEM CONTROLLER

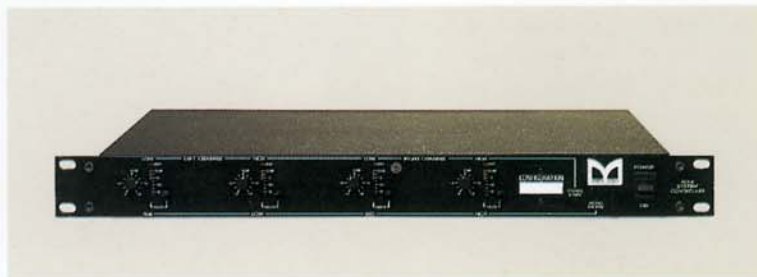
The F2 system will not reach its full performance potential unless a dedicated controller is used. The Martin MX4 is supplied prealigned in two versions, MX4-F2T for systems using F2T supertweeter arrays, and MX4-F2V for systems using F2V for extended high end. MX4-F2V may also be used in its 3-way mode for F2 systems using the F2H without additional high end, as it is fitted with power response correction operating above 7 KHz suiting both horns.

System matched bandpass filters have been set for flat acoustic combining at crossover points. Filter shape provides excellent system transient performance. The F2 system displays a linear phase response at the vital mid/high crossover point, contributing to system fidelity. Crossover points. MX4-F2T: 220/1500/7500 Hz. MX4-F2V: 220/1500/6500 Hz.

Fast attack dual release limiters are in each passband for eliminating amplifier clipping. An internal rotary switch is user adjustable for amp sensitivity matching. Bargraph metering includes limit indicators for monitoring system headroom. System tuning is assisted by a "fine" balance control for each band. The MX4 features electronic balanced inputs and outputs. Output circuitry has full compensation for reactive loads, minimum recommended load is 500 ohms.

The MX4-X version is a stereo sub bass controller using a phase compensated time delayed low pass network, enabling the Martin BSX front loaded sub cabinet to add coherently to the F2B between 70 and 40 Hz. BSX subs will enhance the performance of a flown system below 70 Hz, and extend system response to 28 Hz.

The BSX may be used via MX4-X as a separate sub bass effects system, fed from the mixing desk aux output.



*MX4 System Controller.*



## F2B BASS HORN

### Specifications

#### Bandwidth:

38 Hz – 500 Hz.

#### Frequency response:

No curves are published\*.

#### Power response:

Substantially flat 40-200 Hz.

#### Drivers:

Martin L1540. 15" (38cm) with 4" (10cm) edgewound coil.

#### Impedance:

Nominal 8  $\Omega$  per driver. Min. 7.4  $\Omega$ .

#### Connectors:

Two XLR-3 female, one EP8 female.

#### Flying points:

Two per side, and two at rear match with F2R for total array flexibility.

#### Cabinet:

18mm solid Finnish birch ply.

#### Front protection:

A 12mm plywood quick release lid is fitted as standard to F2B and F2R.

#### Programme Power:

1000 W

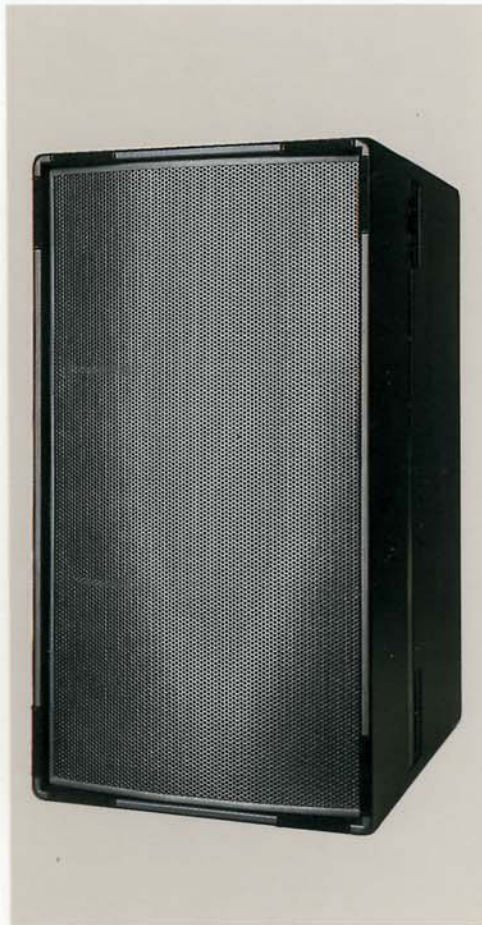
#### Rated Power:

500 W continuous average sine

\*Such frequency response curves of bass horns as are published often show a flat response. This implies that the power response (total energy output) curve is rising at the low end. This cannot be so.

We design for a flat bandpass power response. An F2B bass horn array of sufficient mouth area (four F2B's) needs very little equalisation. The on axis frequency response is not flat, but the room response is.

Flown F2 system showing F2 Bass cabinets arrayed on horizontal centreline.

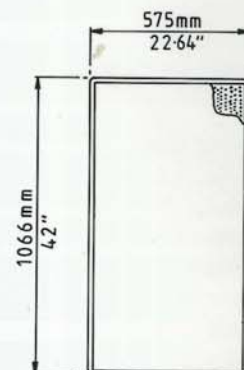
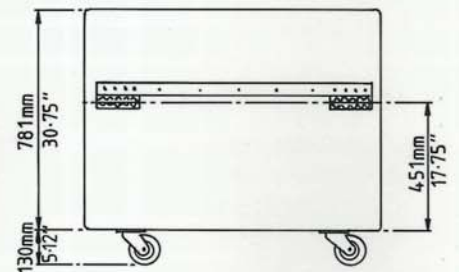


## F2B BASS HORN

This high efficiency bass horn features extremely compact dimensions. It is configured as a "mirror image" hyperbolic horn with dual 15" (38cm) drivers. Derived from our earlier 215 MKIII bass horn, it is 6" (152mm) shorter, and is up to 1.5 dB more efficient between 60-90 Hz. Driver and horn parameters have been empirically tuned as a system, resulting in excellent transient performance and "punch", essential for a flown bass horn.

A bass horn, unlike all other bass enclosures, couples all of its frontal area to the air load. Compared to other types of bass enclosure arrays, bass horns have up to 6 dB efficiency gain and superior mid bass transient performance. Each F2B is rated at 1000 watts programme input. Small, compact arrays will generate immense acoustic power.

Controlled linear cone excursion endows the F2B with a very substantial, solid low end. The F2B has performance sufficient to make the use of a separate sub bass system optional rather than mandatory, saving additional system expense. The F2B is fully compatible with all previous Martin bass horns (except the "S" bin).





## CONNECTORS AND SYSTEM PHASING.

To enable worldwide compatibility, all F2 systems are fitted with identical connectors. Each rack has four XLR-3 female sockets parallel wired to a Cannon EP8 female, whilst each bass has two XLR-3 and one EP8. Identical eight core cables may be used, suitably patched at the amplifier rack. Bass cables are parallel wired for low line resistance. The XLR-3 connectors may be used for patching to other cabinets, achieving optimum amplifier use and reducing the number of cables.

The F2 system is phased identical to all previous and current Martin horn loaded equipment. This is: a positive voltage pulse applied to XLR-3 pin 2 creates a positive pulse at the mouth of F2B and F2M, and a negative pulse at the mouth (or front) of F2H, F2V and F2T.



F2R connector panel

## POWER AMPLIFIERS.

The program power output of many amplifiers will exceed the continuous average sine wave ratings, often by a considerable amount. Thus, an amplifier rated at 500 watts may deliver 700 watts at its clip point under program drive.

With this in mind, we recommend: F2B: 700-800 watts continuous average power into 4 ohms. F2 Rack modules: 470-550 watts continuous average power into 4 ohms. (Rated with both channels driven.) All the HF modules are matched to this size of amp using autotransformers.

Because the F2 system is highly efficient, it will perform well when used with lower powered amplifiers. Purchasers do not necessarily need to change their existing amplifiers. The F2B may be driven with a 470-550 watt amp, with less than a 2 dB loss of headroom. When choosing a bass amp it is as well to remember that an amp capable of driving 2 ohms usually performs best with a 4 ohm load.

## COMPATIBILITY

Existing Martin customers purchasing the F2 will often find it convenient to combine it with their present system. Excellent results have been reported using combined Martin systems.

System crossover points must be near identical for good compatibility, and system design must be similar. All Martin horn loaded systems have benefited from evolutionary development, with substantial improvement in performance and superior formatting. But our system philosophy has not required revision. Thus, the F2 is compatible with Martin RS, VRS and modular (component) systems, except for the "S" bin.

## MARTIN AUDIO

Since the early 1970's, Martin Audio has been setting the pace for Sound Reinforcement systems. With our continued commitment to innovative design and the use of top quality materials, we have powered many top artists in the music industry.

The Martin F2 is the only system available that is quickly and easily adaptable to any size or style of venue. The F2 is the only system that will remain state-of-the-art, as any future component upgrades can easily be replaced within the rack unit.

The unique column array design of the F2 produces more output than any other flying system at any price, and that means fewer boxes and less truck space for a given system. The rack design provides fast change over and service, again saving time and money. And of course, when a large touring system needs to be put into multiple small system use, the F2 can be rapidly reconfigured.

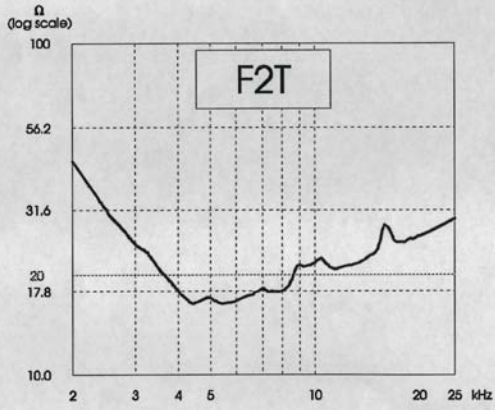
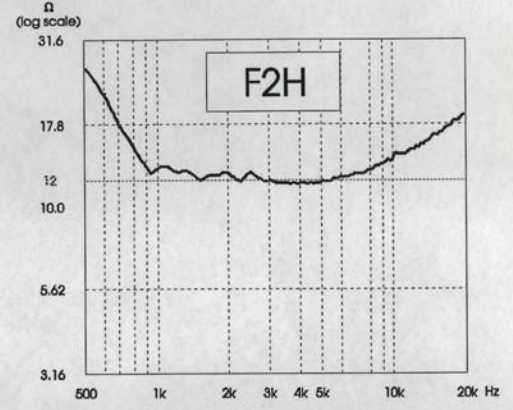
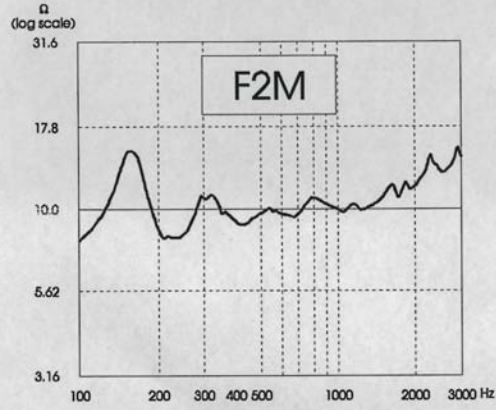
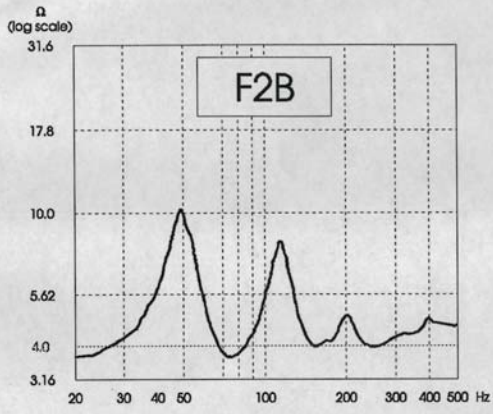
With the F2, Martin Audio continues to lead the way with the introduction of the first user configurable system, offering the flexibility of a custom system, with the high output, clean sound and durability that our worldwide customers have come to expect.

		F2R	F2B	F2M	F1H	F2V	F2T	BLANKING MODULES	FLYING KIT
DIMENSIONS									
IN MM	W	575 (22.5)	575 (22.5)					3 UNITS	-
(inches)	H	1066 (42.0)	1066 (42.0)				SEE MODULE SPECIFICATIONS	4 UNITS	-
	D	750 (29.50)	925 (36.5)						
		INC. WHEELS AND LID							
WEIGHTS Kg (LBS)		55.5 (122)	107 (235)	19.5 (43)	18 (40)	8.5 (19)	9.7 (21.5)	1.9 (4)	1.5 (3.5)
SHIPPING DIMENSIONS									
IN MM	W	585 (23.0)	585 (23.0)	620 (24.5)	620 (24.5)	620 (24.5)	620 (24.5)	620 (24.5)	
(inches)	H	1076 (42.25)	1076 (42.25)	432 (17.0)	432 (17.0)	266 (10.5)	266 (10.5)	266 (10.5)	
	D	755 (29.75)	935 (37.0)	608 (24.0)	608 (24.0)	553 (22.0)	553 (22.0)	533 (22.0)	
SHIPPING WEIGHTS Kg (LBS)		58.5 (129)	110 (242)	21.3 (47)	20 (44)	10.5 (23)	12 (26.5)	4 (9)	2 (4.4)



**Martin Audio Limited**  
 19 Lincoln Road,  
 Cressex Industrial Estate,  
 High Wycombe, Buckinghamshire  
 HP12 3RD  
 Telephone 0494 35312 (4 lines)  
 (International) +44 494 35312  
 Telex 838 048 Maudio G.  
 Fax 0494 438669  
 (International) +44 494 438669

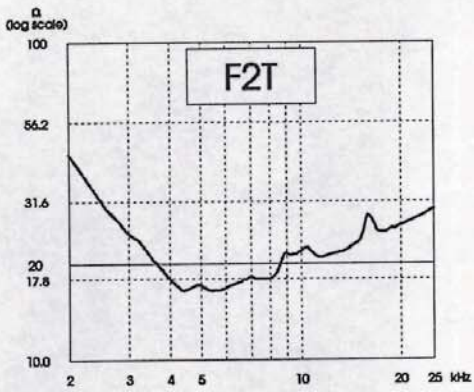
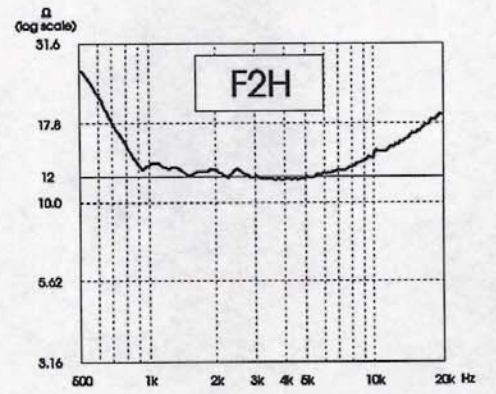
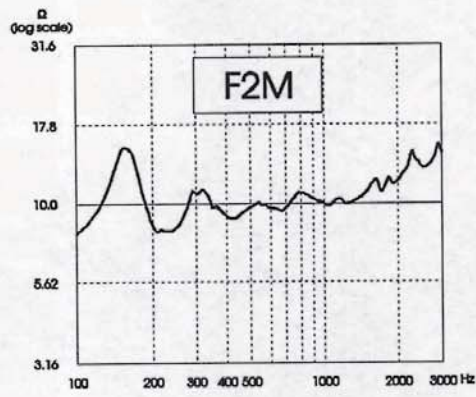
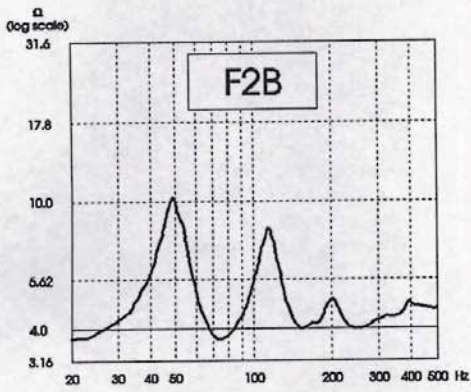




**F2V**

**FSX**





**F2V**

**FSX**