VCA 88.5fm

"The Valley Comes Alive with 88.5"

Technical Report Supporting Grant Application.

A risk analysis of the stations operations was undertaken in 2019, identifying risks in the sustainability of the station, with a number of items within the transmission chain had weighting of *high or greater.*

A technical sub-committee was formed to evaluate how we can reduce the consequences.

We were able to address some of the items in 2019 within our internal budget, with financial support from the CBF and City of Swan. These included antenna upgrade (substantially improving coverage and reception quality) and UPS installation in both the Studio and Transmitter site, reducing the negative impact of power failures at both locations, reducing the risk rating to an acceptable level for those 2 items.

We need to address the following items to ensure continued operations as a priority, as supported by technical reports (attached) they are at product end of life, and no longer able to have manufacturers support.

Encoder/Decoder – the current PYKO units are end of life and we cannot align the units to match industry standards, with no sparing available. These units are part of our critical transmission system and they take the studio audio and digitise it into a format that can be transported over our microwave system and then decoded into a format suitable for the input of the transmitter

Replacement costs – with configuration and installation (which will allow correct transmission deviation and true stereo mode). - **$2,486.00**

Replacement Transmitters – The current transmitter is beyond its serviceable life (and was purchased second hand) failing recently – we have put the spare into service; however that too it is unreliable and is not operating at an expected level. A failure will put the station off-air for an extended period.

We are seeking to purchase both a main and standby transmitter, which are interchangeable (hence identical performance) to allow for repair and maintenance. Our intention is to co-locate them, with the main transmitter feeding into the main antenna (Dual Stack) while the standby being directly connected to our old single folded dipole antenna, allowing changeover (by mains selection), (either automatically or manually) under fault conditions.

VCA 88.5fm

"The Valley Comes Alive with 88.5"

Selection was based on compliant technical specifications and recommendation from Broadcast Australia technical staff (who use these units in unattended sites with high reliability)

Replacement Costs –2 X Nautel VS 300 @ $9,350 = **$18,700** (note alignment and installation will be included as part of the Encoder/Decoder installation and end to end alignment)

Studio Mast – mounted on the Ellenbrook based studio complex is used to mount our microwave antenna system and precision receiver antenna (*for transmission monitoring and compliance recording*). It has not been inspected since installation > 5yrs and ground based visual observation highlights failure of cable retaining systems. It is highly recommended to be inspected by competent trades staff, for corrosion and undertake remedial repairs.

It is not a climbable structure; hence we need to wet hire an EWP and a qualified rigger

- EWP Hire (Wet)– $ 800
- Rigger - $540
- Hardware - $150
- GST - $149.00

Costs – projected **$1,639.00**

Studio Equipment rack – currently holds our microwave system, digital encoders, signal processor (Falcon 3i), precision receiver, program logger, station internet server, and station UPS. It is currently powered from a standard 10 amp wall socket on a shared service (meaning plugging the vacuum cleaner in can take the station off air, plus in some circumstances after a power failure, the inrush current can trip the circuit breaker.

Our recommendation is to feed the rack from an independent dedicated power feed, which will eliminate the problems identified.

Cost – as per quote **$674.30**

Summary

ITEM	COST (inc GST)
Encoder/Decoder (x2)	$2, 486
Transmitter (x2)	$18,700
Mast Maintenance	$1639.00
Studio Power	$674.30
TOTAL	**$23,499.30**

VCA 88.5 FM RISK analysis

FINANCIAL						
EVENT	**LIKELIHOOD**	**CONSEQUENCE**	**RISK RATING**	**MITIGATION**	**NEW RATING**	**Comments**
Insufficient Funds	Low	Station Close	Medium	Increased sponsors	Low	
Increased Rent (Studio)	Medium	Decreased funding	Medium	Seek alternate location – City of Swan Support?	Medium	Costs associated with relocation
Increased Rent (Transmitter)	Low	Decreased Funding	Medium	Seek alternate site – co-locate with KCR?	Medium	High cost for relocation, station downtime.

TECHNICAL						
EVENT	**LIKELIHOOD**	**CONSEQUENCE**	**RISK RATING**	**MITIGATION**	**NEW RATING**	**Comments**
Transmitter Failure	High	No coverage	High	Auto-changeover	Low	Requires 2 transmitters
Link Failure	High	No coverage	High	Duplicate/Alternate path	Low	
Link Failure	High	No Coverage	High	Alternate program source at Tx site	Low	
Power Failure Transmitter (Short)	High	Transmitter may require manual reset	High	Fit UPS to site	Low	Installed Oct 2019
Power Failure Transmitter (Long)	High	Transmitter may require manual reset	High	Fit auto cycling capacity	Medium	
Power Failure Studio (Short)	High	Loss of audio	High	Fit UPS to site of enough capacity to power studio	Low	Installed Sept 2018
Power Failure (Studio) (Long)	High	Jazzler, logger and streaming computers will require manual reset.	High	Have written procedure on restarting systems, configure computers so key programs are in the auto start mode.	Medium	

Falcon 3i Failure	Low	Loss of audio	Medium	Manufacture bypass cables	Medium	Manual Patching required – long outage
Studio mixer failure	Medium	Loss of program	High	Set up alternate facility	Low	Studio 2?
Single CD player failure	Medium	Reduced capacity	Low	Increase number of functioning CD	Low	Can we find a like for like replacement ?
Multiple CD player failure	Low	Inability to run show	Medium	Switch back to alternate source (Jazzler)	Low	

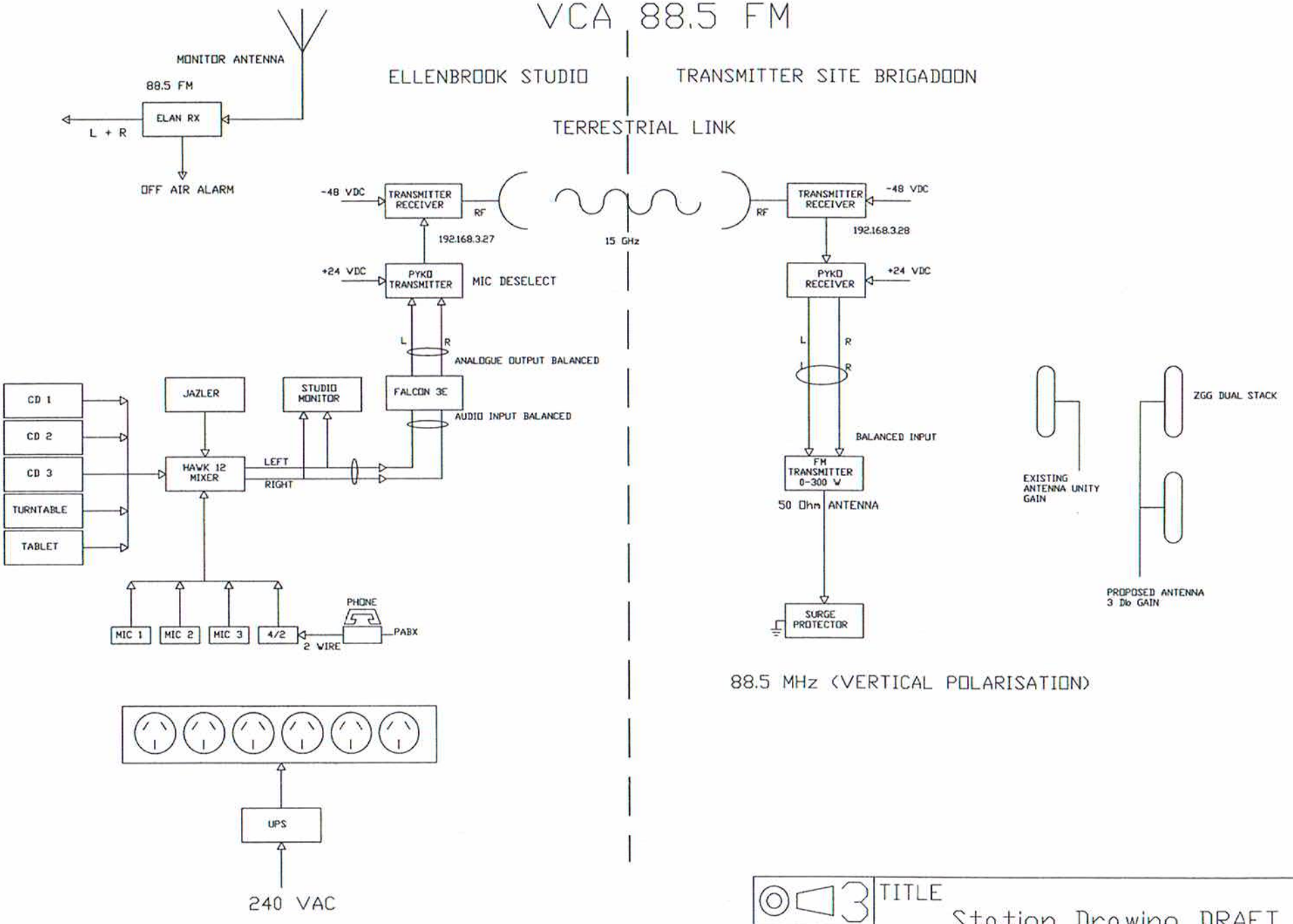
MISCELLANIOUS						
EVENT	**LIKELIHOOD**	**CONSEQUENCE**	**RISK RATING**	**MITIGATION**	**NEW RATING**	**Comments**
Staff attacked in Studio	LOW	Severe – medical treatment – long term fear	CATASTROPHIC	Develop a procedure to ensure safety when alone. Panic Button?	HIGH	Limit sharing studio location on social media.
Studio Fire	LOW	Asset loss, injury to staff, possible death	CATASTROPHIC	Develop a fire plan	Low	
Transmitter Fire	Medium	Loss of assets	CATASTROPHIC	Discuss with 3rd party provider – site hygiene	MEDIUM	Should we store spare on site?

VCA 88.5 FM

ELLENBROOK STUDIO

TRANSMITTER SITE BRIGADOON

TERRESTRIAL LINK



88.5 MHz (VERTICAL POLARISATION)

Lin. Tol.		TITLE	Station Drawing DRAFT						
Ang. Tol.		Project	88.5 VCA Station Documentation						
MM	Dwn.	DTS 04APR19	Ckd.		Appd.		Version	A	88.5 VCA

Direct Communications
Unit 1/10 Harlond Ave
Malaga, WA, 6090

Ph: +61 8 9249 6391
Fx: +61 8 9248 5180
www.directcommunications.com.au

3rd March 2020
Radio Ellenbrook VCA 88.5

FM Transmitter
Model: TEX300LCD/S
SN: 804135

Fault: Radio has low RF power, intermittently stops transmitting, constant FOLDBACK alarm showing.

Findings: Initial testing of the FM transmitter showed the radio RF power to deteriorate over a short time from 150W to 100W. After about 20min it started intermittently resetting itself. The FOLDBACK alarm is constantly showing even on a perfect 50 Ohm load.

Inspection: Initial inspection of the radio shows previous signs of being operated in a high humidity environment. There is "water damage" signs across all the circuit boards.

The power rails and connectors were cleaned up which stopped the FM Transmitter from intermittently resetting. Re-adjusted and re-calibrated the RF power and monitored over time. The radio RF power dropped from 230W to 150W and held steady at 150W at room temperature of 30 degrees. Initial power cannot be raised above 230W to the 300W rating.

Tried re-calibrating the forward/reverse power circuitry but to no avail. The FOLDBACK light is constantly on but will flicker if there is a high VSWR.

The FM transmitter was manufactured in 2008, being 12 years old it is 2 years past its reliability date. Problems will constantly arise as the componentry has surpassed it expected use and with the effects of the humidity on the circuitry its only a matter of time before components and wiring will degrade pass any form of repair.

It is recommended to replace this unit as soon as possible as it will not suffice as a backup spare FM transmitter. The RF output power cannot be relied on to keep a constant power output.

Technician
Daniel Cook

Station Technical Report			
Title	Transmitter Failure		
Report Number	19/13	Contractor:	Direct Communications *J/Card: 27661*
Opened (Date)	23 May, 2019	**Originator**	Jimmy
Closed (Date)	24 May, 2019	**Technician**	Rob Howes
Fault Description	Noted the station was off air – confirmed using 2 alternate methods – as streaming takes its source for the off air transmission that too was impacted. I noted the problem at 06:45, Jimmy informs me that he noted it at 06:05.		
Corrective Action	**06:45** - Checked Wester Power Website – for possible power failure – one noted for the Bullsbrook area. **06:49** - Texted David at *Direct Communications* asking him if he could confirm if any other site equipment was impacted. **08:10** – Went to Studio and confirmed that we had an active program and that it was present at the PYKO input (prior to going into the microwave link). **08:15** – *Direct Comms* advises that site power is present (remote diagnostics) with no known outages. **08:30** – Ran additional off-air checks, noise floor for 88.5 is the same as for other parts of the broadcast spectrum that are not stations (hence no carrier quietening, or possibly white noise modulation from uWave link). **08:45** – Station came back (with no know reason) – we celebrated, scratched our heads, and breathed a sign of relief. **08:55** – Signal died again, (Ohhh) – *Direct Comms* to send tech to site. *Direct Comms* advises that transmitter RF output is rapidly fluctuating between 1 – 200 watts. They will put spare transmitter into service. Report from Direct Communications; *"Transmitter onsite reported as faulty. Mike attended site and removed unit. Transmitter brought back to workshop for calibration and soak testing. Tested all OK. Unit returned to site, all operational. As per J/Card: 27661"* **17:15** – I was advised that we are back on air (on the spare transmitter). **19:40** – Streaming restarted (delayed as I in CBD until 18:30) **20:00** – Observed that the signal and modulation is lower than prior to fault. Will discuss with Direct Communications.		
Notes:			

Station Technical Report			
Title	Transmitter Failure		
Report Number	20/01	Contractor:	Direct Communications *J/Card:*
Opened (Date)	10 Jan, 2020	**Originator**	Jimmy
Closed (Date)	7 Feb, 2020	**Technician**	Rob Howes
Fault Description	It has been observed that we have dropped range coverage previously enjoyed, and that total loss of transmission occurs for 30 – 50 secs several times and hour – in particular when the recorded outside air temp exceeds 35 degrees.		
Corrective Action	Contacted our supplier *Direct Comms* who investigated and noted that transmitter is "folding over" resulting in lower power output. I have asked for them to place the spare transmitter into service, with them planning to do so on Friday 17 Jan, 2020. This was postponed as they were able to restore the transmitter to serviceable state in-situ. 6 Feb – transmitter was dropping in and out of service, and distorted. Appeared to correct itself when the temperature cooled down. 7 Feb – Transmitter replaced with spare.		
Notes:	The spare transmitter had been aligned to industry standards – as part of our planned realignment of the station link and transmission system. Due to this current fault – the transmitter will need to be changed back to match our "adhoc signal path". I acknowledge that this will result in having to repeat the alignment when we are in a position of being able to gain access to the link.		

Station Technical Report			
Title	No Serviceable Spare Transmitter.		
Report Number	20/03	Contractor:	Direct Communications *J/Card:*
Opened (Date)	7 Feb, 2020	**Originator**	Rob Howes
Closed (Date)	Open	**Technician**	
Fault Description	The in-service transmitter has failed and replaced with spare. Resulting in no serviceable spare.		
Corrective Action	Source replacement transmitters (main/spare)		
Notes:	Tech report from Direct Communications highlight that both units are beyond serviceable life with no spares available, with very high probability the we will be without any terrestrial coverage.		

SONIFEX
Distributors Of Audio, Video & Transmission Equipment For Radio & TV Broadcasters

Search

BROADCAST Warehouse
CANADA

> Nautel VS300 – 300W FM Transmitter

Nautel VS300 – 300W FM Transmitter

Kylie.

$7,610 + GST
+ interco

$8,500
850
950

Summary

Nautel's new VS Series FM transmitters are engineered to meet today's most challenging broadcast requirements with an exceptional combination of robustness and reliability in a cost effective design. But the VS Series goes even further with industry first innovations such as IP audio I/O, Livewiretm Support and Nautel's Advanced User Interface (AUI). Each VS transmitter has been optimized for its specific power output to maximize functionality and quality resulting in outstanding value.

Features

BIG TRANSMITTER FEATURES FOR UNMATCHED VALUE

Many transmitters in the 300 W to 2.5 kW class use an inexpensive analog exciter that is sometimes an external unit.

In the VS Series, not only did Nautel engineers integrate the exciter, they implemented a true direct-to-channel digital exciter to achieve class leading performance. That means crystal clear audio and outstanding value. A great achievement considering that digital exciters alone usually sell for over US $10,000.

The VS300 and VS1 transmitters with their built-in RDS generator, GPS input, powerful presets and -90dB SNR make for powerful and extremely cost-effective exciters.

BUILT IN INSTRUMENTATION AND CONTROL

Never before has such sophisticated control been made available in this class of transmitter.

Rob Howes

From: Rob Howes <howes@wn.com.au>
Sent: Thursday, 13 June 2019 8:58
To: 'Kylie Shears'
Cc: 'Jimmy'; 'Graham and Suzanne Dore'
Subject: RE: Nautel VS300 300W FM Transmitter

Thank you Kylie – as discussed on the phone this is just an enquiry while we assess the way forward for the station.

Our webpage (including the link to our live streaming server) is http://www.radiovca88-5fm.org.au/

Regards
Rob Howes
Technical Co-ordinator
VCA 88.5 FM

From: Kylie Shears <kylie@sonifex.com.au>
Sent: Thursday, 13 June 2019 8:45
To: howes@wn.com.au
Subject: Nautel VS300 300W FM Transmitter

TRANSMITTER Replacement (x2)

Hi Rob,

Thanks very much for your call this morning, and please accept my apologies for the trouble you had with our website. I've had a look and can see that our email address isn't included in the footer, though it is included on the Contact Us page. I've asked the IT person to look for your email as well, since I don't want to be missing anyone's requests!

As discussed, we are the Nautel representative in Australia, and can supply a VS300 for a little less than $9,350 including all freight, clearance and GST charges.

If I can be of any further assistance, please don't hesitate to contact me.

Kind regards,

$9,350 ea x2

QUOTE

Quote No: 4568
Organisation: RAD004
Date: 10/01/2020
Page: 1

ABN: 81 378 028 026
ACN: 071 658 770
PO Box 2358, Malaga, WA 6944
U1/10 Harlond Ave, Malaga, WA, 6090
Tel: +61 8 9249 6391
Fax: +61 8 9248 5180

Quote To:
Radio VCA 88.5
PO Box 2285
Ellenbrook WA 6069

Narration

IP ethernet encoder links upgrade

Code	Description	Quantity	Price	Line Total
terra-IEX	2 channel audio ofer IP EN-DE	2.00	730.00	1,460.00
Pair				
LAB-Tech	Labour Communications Technician	8.00	100.00	800.00
reconfigure test and setup link units on Amp and install				

Subtotal:	2,260.00
GST:	226.00
Total:	**2,486.00**

Australian Dollars

ATEÏS

DELIVERING YOUR MESSAGE

Terracom - TERRA-IEX

2 CHANNEL AUDIO OVER IP ENCODER / DECODER

TERRA-IEX CHARACTERISTICS

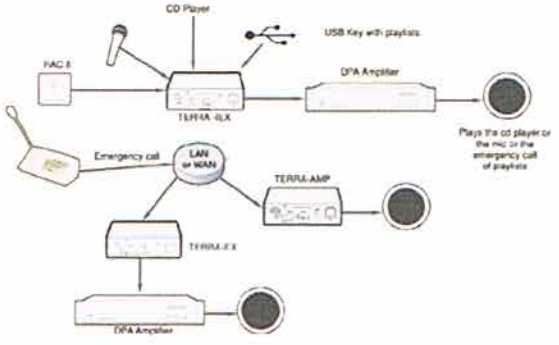
- 2 Mic/line balanced inputs
- 2 independent balanced line outputs
- 1 headphone output on mini-jack
- 1 SPDIF Transceiver - optional
- Audio inputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz
- Audio outputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz
- Ethernet interface including POE (Power Over Ethernet)
- 24 VDC power supply (if no POE available)
- G.711, G.722, MP3 audio encoding/decoding
- 1 USB port for USB memory stick
- Power & Status LED
- IR receiver - optional
- 3 contact inputs
- 1 relay output
- RS 232 on Euro Block
- Power consumption: 3 W
- Weight: 434 g
- Dimensions (mm): Depth 104, Height 32, and Width 109.

TERRA-IEX is a 2 channel audio over IP encoder/decoder.
The balanced line input can be used as an audio source for your IP network, like a cd player or a sound card of a PC and be encoded in high quality MP3. A microphone can also be plugged on the mic input and be encoded in G.722. An optional S/PDIF input can also be used as a source. The TERRA-IEX streams its inputs in unicast or multicast. The same device provides also 2 independent balanced outputs for half-duplex communication or for local outputs.
By adding an USB memory stick, playlists can be used as a backup of the decoded stream or as a source for the IP streaming. The volume and the channel can be modified locally with an IR remote control or with a low-cost source selector, the RAC.

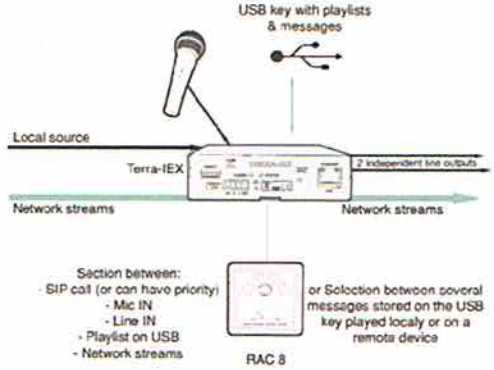
Thanks to the analog inputs, powerful scenario can be implemented, like push buttons connected to the TERRA-IEX will send background music in predefined zones and another button will send the mic input for general announcement. At the same time a higher priority can be given to SIP emergency calls.
Priority management, volume management, event management & scheduler are set up thanks to embedded webpages: an impressive audio over IP Terminal without direct need of a PC.

TERRA-IEX belongs to the TERRACOM range, the new ATEÏS Audio over IP solution.

APPLICATION



TERRA-IEX synoptic



www.ateis-europe.com
ATEÏS Europe BV - Sydneystraat 42 - 3047BP ROTTERDAM - NETHERLANDS
Phone +31 (0)10 2088690 - Fax +31 (0)10 2088699

O&S ELECTRICAL SERVICES PTY LTD

Electrical Estimate

Scope of works for: 88.5fm Ellenbrook Community Radio- Attn Rob Howes

DATE: 01/08/2019

Site Details: Suite 5 46 Coolamon Boulevard, Ellenbrook

Proposed electrical work

Supply and install 1x 56 series 15amp single phase outlet for station radio back up on own dedicated circuit protected by RCBO

- Install 6mm cabling which will allow for a single phase sub-board if require in future.

Price:

Labour & Materials:	$613.00
GST:	$61.30
Total:	**$674.30**

PO BOX 1748, Malaga WA 6944- EC009133- Phone: 0430100569